

STATE OF SOUTH DAKOTA CLASS SPECIFICATION

Class Title: Transportation Region Engineering Specialist

Class Code: 40861

A. Purpose:

Directs the work of a region engineering program including Design, Materials, Traffic Control, and Bridge Inspection by prioritizing and scheduling projects and procedures; evaluating constructibility of proposed work; developing and implementing policies, procedures, standards, and specifications; enforcing compliance with department guidelines; assigning work to employees and monitoring progress; and providing engineering expertise to other employees, agencies, local governments and the public in the region to ensure that program goals are carried out according to department guidelines.

B. Distinguishing Feature:

Transportation Region Engineering Specialists manage a region engineering program in Design, Traffic Control, Materials, or Bridge Inspection.

Transportation Lead Project Engineers provide work coordination and direction, and engineering expertise to a minimum of four professional positions, at least one of which is a Transportation Project Engineer; and manage assigned transportation projects.

C. Functions:

(These are examples only; any one position may not include all of the listed examples nor do the listed examples include all functions which may be found in positions of this class.)

1. Directs the Region Design Program by assigning and scheduling design projects, coordinating and overseeing work to keep designs on track, designing, letting construction and maintenance plans to bid, directing the use of computer design programs, and training employees to become proficient in design.
 - a. Schedules, assigns, oversees, and reviews design and plan preparation and other work done by engineers, technicians, draftsmen, and consultants; and others who assist in plan preparation in region and area offices.
 - i. Meets with area staff to determine design work loads and balances work assignments throughout the region.
 - ii. Directs work among area, region, and central offices.
 - b. Schedules and conducts meetings for project scoping, field inspections, design inspections, and other meetings as needed.
 - i. Resolves site-specific construction issues.
 - ii. Recommends changes to, and approves, programmed projects.
 - c. Creates and maintains a project tracking system for Region Design projects from initial concept to award.
 - i. Creates and monitors timelines for completion of preliminary plans, plan reviews, and completion of final plans.
 - ii. Calculates durations for design.
 - iii. Ensures requirements such as surveys are being performed and submitted.
 - iv. Provides technical assistance and training to keep designs on track and in compliance with current standards.
 - v. Keeps department stakeholders informed of project progress.
 - d. Schedules and conducts bid lettings.
 - i. Conducts a final plans review.

- ii. Prepares cost estimates.
 - iii. Prepares legal advertisements.
 - e. Designs construction and maintenance plans, calculates quantities, prepares cost estimates and letting documents for a wide variety of projects let in the Region Design office.
 - i. Develops and maintains standard notes and drawings.
 - ii. Maintains a plans library as a resource for future projects.
 - iii. Produces quick plans for emergency repairs and special projects.
 - f. Directs the use of computer programs and oversees maintenance of cell libraries to assist in the completion of plans.
 - g. Maintains a list of contractors who work in the region, and categorizes them for informal lettings.
2. Directs the Region Traffic Program and traffic control on all contracted and maintenance projects in a region to ensure conformance with department standards and the Manual on Uniform Traffic Control Devices (MUTCD); and provides technical expertise and information on traffic-related issues to ensure compliance with department goals to provide adequate capacity of highways to carry traffic volumes and to enhance safety on the state's highway systems.
- a. Directs, designs, and reviews traffic control for project plans for all construction and maintenance projects in a region.
 - i. Determines project scope, sequences, special notes, and cost estimates for projects.
 - ii. Reviews plans done by consultants for compliance with standards.
 - iii. Designs and reviews traffic control for project plans.
 - iv. Inspects highway construction projects and maintenance areas for proper work zone traffic control.
 - b. Directs the preparation of permanent signing, pavement marking, flashing beacon, roadway lighting, and traffic signal plans to ensure traffic control devices throughout the region are up to date and operating efficiently.
 - i. Conducts reviews of traffic control devices to determine changes needed to maximize highway safety.
 - ii. Ensures signing complies with the MUTCD and state policies and standards.
 - iii. Delegates work assignments to personnel and monitors progress.
 - iv. Reviews completed work for compliance with department standards.
 - c. Participates in establishing policies for safety and traffic control, develops standards and specifications, and establishes procedures for highway signing activities and the collection of data.
 - d. Conducts road safety audits throughout the region, and solicits public involvement to identify safety improvement projects.
 - i. Analyzes traffic and accident data to identify hazards.
 - ii. Reviews traffic signal timing and operations.
 - iii. Determines proper corrective actions to enhance safety.
 - iv. Develops plans to construct safety improvements.
 - e. Directs region-wide maintenance of permanent traffic control by assigning work to Region Traffic Office staff and crews, and managing the progress of work; and coordinates with Area Engineers to provide work assignments to engineering and maintenance personnel.
 - i. Oversees traffic studies, field inspections, and procurement of supplies.
 - ii. Oversees signing and striping crews and schedules.
 - iii. Assigns work to outlying maintenance shops.

- iv. Works with area personnel on special and emergency traffic control situations.
 - f. Provides assistance to local governments on traffic concerns.
 - g. Manages the region's Beautification, Tourism Oriented Directional Signs (TODS), and Logo programs.
 - i. Issues billboard permits.
 - ii. Removes illegal billboards.
 - iii. Coordinates work with region and area crews.
3. Directs the activities of the Region Materials Program; provides material recommendations for construction projects in the region; assigns Region Materials technicians to projects; verifies and confirms testing requirements for compliance with the Materials Manual, Specifications Book, and federal standards; and ensures that all materials and testing equipment used on projects complies with specifications and current mandates to ensure projects are built according to state and federal requirements.
- a. Ensures compliance with all material testing and certification requirements on construction projects.
 - i. Conducts field or site inspections to evaluate the quality of project materials and verify testing procedures are being followed.
 - ii. Reviews and reports on Independent Assurance (IA) and Acceptance sampling and testing results, and determines required remedial actions.
 - iii. Certifies that project testing documentation has been completed, and recommends approval of the project.
 - iv. Determines price adjustment for materials that do not comply with specifications.
 - v. Directs inspections of commercially prepared concrete and steel products.
 - b. Performs preliminary engineering work to ensure quality and quantity of construction materials is adequate and available for region projects.
 - i. Oversees location of new material and waste sites including scouting, drilling and taking soil samples, mapping and designing sites, negotiating prices and quantities, securing and recording options.
 - ii. Recommends materials for region projects, and investigates and evaluates quality and quantity of materials available.
 - iii. Obtains mining licenses, and archaeological and environmental clearances on potential material sources.
 - iv. Reviews material items in construction plans, and recommends project-specific adjustments to specifications.
 - v. Negotiates terms of borrow agreements, and acquires haul road agreements.
 - vi. Evaluates design proposals for upcoming surfacing and resurfacing projects.
 - c. Manages a region materials laboratory to facilitate compliance with materials testing and certification requirements.
 - i. Oversees maintenance, calibration, and documentation of laboratory equipment.
 - ii. Orders and maintains a region inventory, and issues items for testing project materials.
 - d. Administers the region's safety and training activities.
 - i. Ensures that soils, aggregate, and concrete testing courses are conducted in compliance with specifications and the Materials Manual.
 - ii. Manages the region's Radiological Safety Program for nuclear density meters.
 - e. Consults with area personnel on construction issues and makes recommendations on materials-related problems.
 - f. Composes and distributes a Region Materials newsletter.

4. Directs the Region Bridge Program and oversees the inspection and maintenance of all state trunk and interstate highway structures in a region in accordance with National Bridge Inspection Standards (NBIS) and department policies; performs final inspections of all structure-related construction involving state funding; offers expertise and assistance within the region for all structure-related issues; and oversees the work of a region bridge crew to maintain all structures in a safe and reliable condition for the public.
 - a. Schedules, directs, and performs bridge inspections including roadway approaches, guardrail, drainage, deck, superstructure, substructure, berms, channel flow, footing scour, etc.
 - i. Directs the work of other inspectors, and reviews and approves their inspection reports.
 - ii. Performs immediate inspections on structures that have probable damage resulting from accidents or natural disasters, assesses damages, and takes necessary action to ensure safety.
 - iii. Implements traffic control measures and safety equipment for work zones.
 - iv. Coordinates inspections with other agencies and local governments.
 - v. Updates structure data and condition ratings into the bridge management system (PONTIS).
 - vi. Schedules and monitors training for bridge inspectors.
 - b. Directs maintenance and repair of structures throughout the region following state and federal standards and policies.
 - i. Defines and provides direction for the repair of structures and monitors repairs.
 - ii. Selects items for repair by maintenance crews, and those that need to be let to contract; and prioritizes the needs of each.
 - iii. Directs a region bridge crew to accomplish general maintenance and upkeep on structures.
 - iv. Prioritizes maintenance activities to balance areas of greatest need with locations of greatest public impact.
 - v. Orders materials and equipment for structure repairs.
 - c. Recommends and categorizes structure construction projects to be included in the State Transportation Improvement Program (STIP).
 - i. Determines structural repair needs and cost estimates.
 - ii. Provides the Bridge Program with new and updated construction projects to be included in the construction program.
 - iii. Determines repair priorities and makes recommendations regarding placement of projects in the STIP.
 - e. Performs preliminary engineering for region structure projects.
 - i. Attends site inspections, scoping meetings, and preconstruction meetings as the region's expert in structure-related issues.
 - ii. Designs and assembles structure project plans.
 - iii. Reviews plans related to structure work that are prepared by others.
 - f. Performs final inspections on structure projects.
 - i. Inspects new and rehabilitation projects in conjunction with area staff and determines if work is acceptable; and submits a summary of the inspection to the Region Engineer.
 - ii. Compiles and documents as-built data into the bridge inventory file.
5. Performs other work as assigned.

D. Reporting Relationships:

Reports to a Region or Operations Engineer. Does not supervise, but routinely schedules, assigns, and monitors work of assigned crews and technicians; and coordinates work for area staff with Area Engineers.

E. Challenges and Problems:

Challenged to maintain control over a comprehensive work load that encompasses a one-fourth portion of the state. This is challenging because routine work is substantial and diverse additional projects are added to it; difficulty of projects ranges from basic to extreme; work forces often need to be recruited from throughout the region; there is extensive public involvement; local governments and other state and federal agencies must often be considered; schedules must be revised continually with changes in priority and interruptions in sequences; work must be scheduled and progress monitored; alternatives must be found to assist when work falls behind; and deadlines must be met. Further challenged to develop projects economically while maintaining quality and integrity, and ensuring public safety and customer service.

Problems include working on multiple projects simultaneously; providing work direction to multiple work forces without direct supervisory authority and scheduling work around their primary duties; keeping track of work over distance; seasonal limitations; making sure work complies with current standards; providing technical expertise over the phone or e-mail; developing engineering cost estimates where no historic data exists; getting plans done by letting deadlines; locating material sources in areas where they are not readily available and making sure they are economically feasible; negotiating with landowners and environmental agencies on proposed mining locations; projecting adequate supplies and equipment for a year; determining a procedure to follow when there are no official guidelines; staying current with revisions to standards, manuals, common construction practices, etc.; and resolving plan errors quickly because of project time constraints.

F. Decision-making Authority:

Decisions include priority and distribution of projects to staff throughout the region; resolution of unclear design issues; how various projects will be designed; project sequences; whether additional survey is necessary and who will do it; final content of plan sheets; letting dates for informal projects; whether or not traffic control is reasonable, properly prepared, and in conformance with MUTCD; the feasibility of detours; which permanent signing is used and how pavement markings are installed; number of lanes needed; suggested improvements to remedy high accident areas; whether an engineering study is needed and interpretation of the data collected; material recommendations for preliminary projects; source location of material; whether material is suitable for the intended use; terms of borrow agreements including prices for soil, loss of use, crop damage, seeding, compensation for CRP payments, etc.; whether all sampling and testing requirements have been completed for a project; what caused a failing test and how to correct the material; price adjustments for specification deviations; bridge inspection schedules; structural condition ratings; whether a problem on a structure is critical; the scope of bridge repairs and when they should be made; whether bridge maintenance needs can be met by existing staff or should be let to contract; where bridge projects will be placed in priority on the STIP; whether completed work is acceptable; recommendations for changes in policies, standards, and manuals; recommendations for equipment and supplies.

Decisions referred include approval of major changes in project scope, design, or schedule; final approval of type and class of material; prices paid for high-value land material sources; resolution of non-compliance with minimum testing requirements; and final approval of projects into the construction program; final priority of structure needs if required; review of severe structural damage and repair; approval of repairs where additional funds would be needed; authorization of overtime.

G. Contact with Others:

Daily contact with other region specialists to discuss development of plans, project scopings, plan reviews, issues relating to the specialty, etc.; with area staff to coordinate assignment of projects, provide work direction and expertise, and monitor project progress; with maintenance supervisors to assign repair needs and answer their questions; and with the public to answer questions about projects in the region; weekly contact with Area Engineers and Engineering Supervisors, and central office staff regarding plan preparation and reviews, project scopings, informally let plans, project scheduling, construction and material issues; with contractors to assist in implementing standard specification requirements; with companies and local governments to coordinate or discuss project purpose, resources, and inspections; and with project engineers to consult and coordinate project work issues; monthly contact with landowners to discuss borrow acquisition; contact as needed with federal and state agencies, local governments, and consultants, to exchange information and expertise on issues that are relative to the specialty; and with media and civic groups to provide information.

H. Working Conditions:

Incumbents work in a typical office environment, and on project sites where they are exposed to traffic, weather conditions, heavy equipment in operation, and hazardous situations and materials.

I. Knowledge, Skills, and Abilities:

Knowledge of:

- the principles and practices of civil engineering as they apply to public works;
- applicable technical phases of civil engineering such as materials, design, traffic control, and certified bridge inspection;
- exact sciences such as mathematics, physics, and chemistry;
- the topography, geology, and demography of the region in which they are located;
- applicable state and federal laws and regulations;
- department and region policies, procedures, and practices.

Ability to:

- prepare, interpret, and implement civil engineering plans, maps, specifications, and reports;
- plan and administer the work of an engineering specialty in a large geographical area;
- establish and maintain working relationships with a wide variety of individuals and agencies;
- communicate information clearly and concisely, both orally and in writing;
- use a computer and applicable engineering software.